# 79XX
# DATASHEET

## Specification Revision History:

| Version | Date | Description |
|---|---|---|
| V1.0 | 2022/01 | New |
| V1.1 | 2024/03 | Modify Ordering Information |
| V1.2 | 2025/02 | Modify Ordering Information |
| V1.3 | 2025/03 | Add application precautions and overall typesetting. |

## General Description

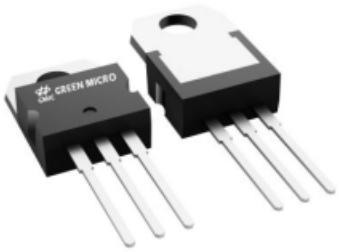
The 79XX series is 3-pin fixed negative output type monolithic voltage regulators. A stabilized fixed negative output voltage is obtained from an unstable DC input voltage without using any external parts. Eleven types of fixed output voltage are available from –5V through –10V, –12V, –15V, –18V, –20V, and –24V. They can be used widely as power circuits with a current capacitance of up to 1.5A.

79XX is available in TO220-3 package.

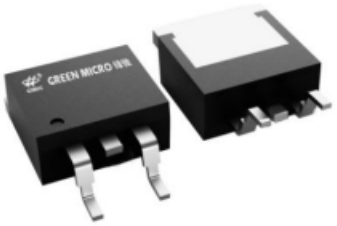
## Features

- No external components
- Output voltage : 7905: –5V, 7906: –6V, 7908: –8V, 7909: –9V, 7910: –10V, 7912: –12V, 7915: –15V, 7918: –18V, 7920: –20V, 7924: –24V
- Overcurrent limit circuit built-in
- Thermal over-load protection built-in
- Area of safe operation (ASO) circuit built-in

## The appearance of the product



TO220



TO-263

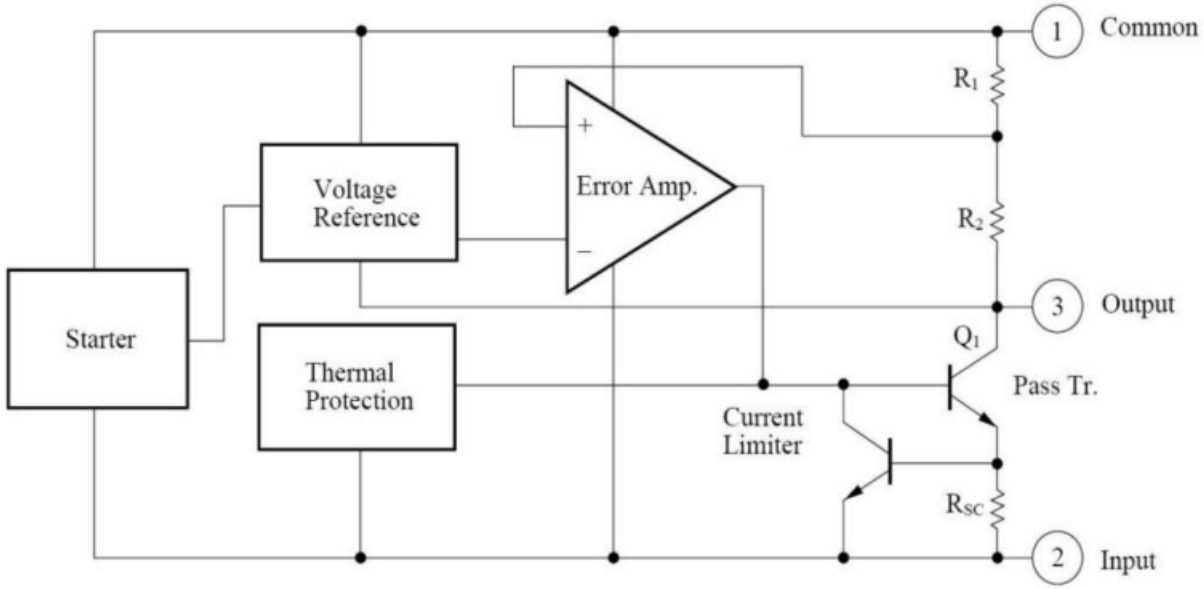
TO-252

## Ordering Information

| Product Model | Package Type | Marking | Packing | Packing Qty |
|---|---|---|---|---|
| L7912CV(GMIC) | TO220 | 7912 306 | 管装 | 1000PCS/盒 |
| L7912CT(GMIC) | TO263 | 7912 306 | 编带 | 1000PCS/盘 |
| 79M12(GMIC) | TO252 | 79M12 306 | 编带 | 2500PCS/盘 |
| 7912(GMIC) | TO220 | 7912 0C06 | 管装 | 1000PCS/盒 |
| 7912(GMIC) | TO263 | 7912 G306 | 编带 | 1000PCS/盘 |
| 79M12A(GMIC) | TO252 | 79M12 GC06 | 编带 | 2500PCS/盘 |
| L7915CV(GMIC) | TO220 | 7915 269 | 管装 | 1000PCS/盒 |
| L7915CT(GMIC) | TO263 | 7915 269 | 编带 | 1000PCS/盘 |

| | | | | |
|---|---|---|---|---|
| 79M15(GMIC) | TO252 | 79M15 269 | 编带 | 2500PCS/盘 |
| 7915(GMIC) | TO220 | 7915 0269 | 管装 | 1000PCS/盒 |
| 7915(GMIC) | TO263 | 7915 G269 | 编带 | 1000PCS/盘 |
| 79M15A(GMIC) | TO252 | 79M15 GB69 | 编带 | 2500PCS/盘 |

## Block Diagram




**Absolute Maximum Ratings (Ta=25。C)**

| Characteristics | Symbol | Value | Units |
|---|---|---|---|
| Input Voltage | $V_i$ | -35 *1 | V |
| | | -40 *2 | |
| Power dissipation | $P_D$ | 15 *3 | W |
| Operating Temperature Range | $T_{OPR}$ | -40~+125 | °C |
| Storage Temperature Range | $T_{STG}$ | -55~+150 | °C |
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 5 | °C/W |
| Thermal Resistance Junction-Air | $R_{\theta JA}$ | 65 | °C/W |

*1 7905, 7906, 7907, 7908, 7909, 7910, 7912, 7915, 7918

*2 7920, 7924

*3 Follow the derating curve. When Tj exceeds 150° C, the internal circuit shuts off the output.

**7905 Electrical Characteristics** (-5V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -4.8 | -5.0 | -5.2 | V |
| Output Voltage tolerance | | $V_i$=-7V to -20V,$I_O$=5mA to 1A $P_D$≤15W | | -4.75 | | -5.25 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | $V_i$=-7V to -25V | | 3 | 100 | mV |
| | | | $V_i$=-8V to -12V | | 1 | 5 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 10 | 100 | mV |
| | | | Io=250 to 750mA | | 3 | 50 | |
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | | 2 | 4 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | Vi=-7V to -25V, $T_J$=+25°C | | | | 1.3 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 40 | | μV |
| Ripple rejection ratio | RR | Vi=-8V to -18V, $I_O$= 100mA f= 120Hz | | 62 | 74 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O$/Ta | $I_O$=5mA, $T_J$=0 to 125°C | | | -0.4 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.

Note 2) Unless otherwise specified, $V_I$=–10V, $I_O$=500mA, $C_I$=2μF, $C_O$= 1μF

**7906 Electrical Characteristic** (-6V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -5.75 | -6 | -6.25 | V |
| Output Voltage tolerance | | Vi=-8V to -21V,IO=5mA to 1A $P_D$≤15W | | -5.7 | | -6.3 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-8V to -25V | | 4 | 120 | mV |
| | | | Vi=-9V to -13V | | 1.5 | 60 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 10 | 120 | mV |
| | | | Io=250 to 750mA | | 3 | 60 | |
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | | 2 | 4 | mA |
| Input bias | $\Delta I_{bias(IN)}$ | $V_i$=-8V to -25V, $T_J$=+25°C | | | | 1.3 | mA |

| | | | | | | |
|---|---|---|---|---|---|---|
| fluctuation | | | | | | |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | 44 | | μV |
| Ripple rejection ratio | RR | Vi=-9V to -19V, $I_O$= 100mA f= 120Hz | 60 | 73 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O$/Ta | $I_O$=5mA, $T_J$=0 to 125°C | | -0.5 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) Unless otherwise specified, VI=–11V, IO=500mA, CI=2μF, CO= 1μF

**7907 Electrical Characteristic** (-7V,Type; Ta=25 C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -6.7 | -7 | -7.3 | V |
| Output Voltage tolerance | | Vi=-9V to -22V,$I_O$=5mA to 1A $P_D$≤15W | | -6.65 | | -7.35 | |
| Line Regulation | REGIN | $T_J$=+25°C | Vi=-9V to -25V | | 5 | 140 | mV |
| | | | Vi=-10V to -14V | | 1.5 | 70 | |
| Load Regulation | REGL | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 140 | mV |
| | | | Io=250 to 750mA | | 4 | 70 | |
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | | 2 | 4 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | $V_i$=-9V to -25V, $T_J$=+25°C | | | | 1.3 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 48 | | μV |
| Ripple rejection ratio | RR | Vi=-10V to -20V, IO= 100mA f= 120Hz | | 58 | 72 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | IO= 1A, $T_J$=+25°C | | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | | 2. 1 | | A |

| | | | | | | |
|---|---|---|---|---|---|---|
| Outputvoltage temperaturecoe fiient | $\Delta I_O/Ta$ | IO=5mA, $T_J$=0 to 125°C | | -0.5 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) Unless otherwise specified, VI=–12V, IO=500mA, CI=2μF, CO=1μF

**7908 Electrical Characteristic** (-8V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | TJ=+25°C | | -7.7 | -8 | -8.3 | V |
| Output Voltage tolerance | | Vi=-10V to -23V, IO=5mA to 1A, PD≤15W | | -7.6 | | -8.4 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-10.5Vto -25V | | 6 | 160 | mV |
| | | | Vi=-11V to -17V | | 2 | 80 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 160 | mV |
| | | | Io=250 to 750mA | | 4 | 80 | |
| Bias Current | Ibias | $T_J$=+25°C | | | 2.2 | 4.5 | mA |
| Input bias fluctuation | ΔIbias(IN) | Vi=-10.5V to -25V, $T_J$=+25°C | | | | 1 | mA |
| Load bias current fluctuation | ΔIbias(L) | IO=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 52 | | μV |
| Ripple rejection ratio | RR | $V_i$=-11V to -21V, $I_O$= 100mA f= 120Hz | | 56 | 71 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O/Ta$ | $I_O$=5mA, $T_J$=0 to 125°C | | | -0.6 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) Unless otherwise specified, VI=–14V, IO=500mA, CI=2μF, CO=1μF

**7909 Electrical Characteristic** (-9V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -8.65 | -9 | -9.35 | V |
| Output Voltage tolerance | | $V_i$=-11.5V to -24V, $I_O$=5mA to 1A, $P_D$≤15W | | -8.55 | | -9.45 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-11.5Vto -26V | | 7 | 180 | mV |
| | | | Vi=-12V to -18V | | 2 | 90 | |
| Load Regulation | REGL | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 180 | mV |
| | | | Io=250 to 750mA | | 4 | 90 | |
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | | 2.2 | 4.5 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | Vi=-11.5V to -26V, $T_J$=+25°C | | | | 1 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 58 | | μV |
| Ripple rejection ratio | RR | Vi=-12V to -22V, $I_O$= 100mA f= 120Hz | | 56 | 71 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O$/Ta | $I_O$=5mA, $T_J$=0 to 125°C | | | -0.6 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.

Note 2) Unless otherwise specified, VI=–15V, IO=500mA, CI=2μF, CO= 1μF

**7910 Electrical Characteristic** (-10V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -9.6 | -10 | -10.4 | V |
| Output Voltage tolerance | | Vi=-12.5V to -25V, $I_O$=5mA to 1A, $P_D$≤15W | | -9.5 | | -10.5 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-12.5Vto -27V | | 8 | 200 | mV |
| | | | Vi=-13V to -19V | | 2.5 | 100 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 200 | mV |
| | | | Io=250 to 750mA | | 4 | 100 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | 2.5 | 5 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | Vi=-12.5V to -27V, $T_J$=+25°C | | | 1 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | 64 | | μV |
| Ripple rejection ratio | RR | Vi=-13V to -23V, IO= 100mA f= 120Hz | 56 | 71 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O$/Ta | $I_O$=5mA, $T_J$=0 to 125°C | | -0.7 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.

Note 2) Unless otherwise specified, VI=–16V, IO=500mA, CI=2μF, CO= 1μF

**7912 Electrical Characteristic** (-12V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -11.5 | -12 | -12.5 | V |
| Output Voltage tolerance | | Vi=-14.5V to -27V, IO=5mA to 1A, $P_D$≤15W | | -11.4 | | -12.6 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-14.5Vto -30V | | 10 | 240 | mV |
| | | | Vi=-16V to -22V | | 3 | 120 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 240 | mV |
| | | | Io=250 to 750mA | | 4 | 120 | |
| Bias Current | Ibias | $T_J$=+25°C | | | 2.5 | 5 | mA |
| Input bias fluctuation | ΔIbias(IN) | Vi=-14.5V to -30V, $T_J$=+25°C | | | | 1 | mA |
| Load bias current fluctuation | ΔIbias(L) | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 75 | | μV |
| Ripple rejection ratio | RR | Vi=-15V to -25V, $I_O$= 100mA f= 120Hz | | 55 | 70 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1. 1 | | V |

| | | | | | | |
|---|---|---|---|---|---|---|
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | 2.1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O/Ta$ | $I_O$=5mA, $T_J$=0 to 125°C | | -0.8 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) Unless otherwise specified, $V_I$=–19V, $I_O$=500mA, $C_I$=2μF, $C_O$= 1μF

**7915 Electrical Characteristic** (-15V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -14.4 | -15 | -15.6 | V |
| Output Voltage tolerance | | Vi=-17.5V to -30V, $I_O$=5mA to 1A, $P_D$≤15W | | -14.25 | | -15.75 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-17.5Vto -30V | | 11 | 300 | mV |
| | | | Vi=-20V to -26V | | 3 | 150 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 300 | mV |
| | | | Io=250 to 750mA | | 4 | 150 | |
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | | 2.5 | 5 | mA |
| Input bias fluctuation | $\Delta_{Ibias(IN)}$ | Vi=-17.5V to -30V, $T_J$=+25°C | | | | 1 | mA |
| Load bias current fluctuation | $\Delta_{Ibias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 90 | | μV |
| Ripple rejection ratio | RR | Vi=-18.5V to -28.5V, $I_O$= 100mA, f= 120Hz | | 54 | 69 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1.1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | | 2.1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O/Ta$ | $I_O$=5mA, $T_J$=0 to 125°C | | | -0.9 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.
Note 2) Unless otherwise specified, $V_I$=–23V, $I_O$=500mA, $C_I$=2μF, $C_O$= 1μF

**7918 Electrical Characteristic** (-18V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -17.3 | -18 | -18.7 | V |
| Output Voltage tolerance | | Vi=-21V to -33V, $I_O$=5mA to 1A, $P_D$≤15W | | -17. 1 | | -18.9 | |
| Line Regulation | REGIN | $T_J$=+25°C | Vi=-21Vto -33V | | 15 | 360 | mV |
| | | | Vi=-24V to -30V | | 5 | 180 | |
| Load Regulation | REGL | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 360 | mV |
| | | | Io=250 to 750mA | | 4 | 180 | |
| Bias Current | $I_{bias}$ | TJ=+25°C | | | 2.5 | 5 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | Vi=-21V to -33V, $T_J$=+25°C | | | | 1 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 110 | | μV |
| Ripple rejection ratio | RR | Vi=-22V to -32V, $I_O$= 100mA f= 120Hz | | 53 | 68 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O$/Ta | $I_O$=5mA, $T_J$=0 to 125°C | | | -1 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.

Note 2) Unless otherwise specified, $V_I$=–27V, $I_O$=500mA, $C_I$=2μF, $C_O$= 1μF

**7920 Electrical Characteristic** (-20V,Type; Ta=25。C)

| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -19.2 | -20 | -20.8 | V |
| Output Voltage tolerance | | Vi=-23V to -35V, $I_O$=5mA to 1A, $P_D$≤15W | | -19 | | -21 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-23Vto -35V | | 16 | 400 | mV |
| | | | Vi=-26V to -32V | | 5.5 | 200 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 400 | mV |
| | | | Io=250 to 750mA | | 4 | 200 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Bias Current | $I_{bias}$ | $T_J$=+25°C | | 3 | 5 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | Vi=-23V to -35V, $T_J$=+25°C | | | 1 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | 135 | | μV |
| Ripple rejection ratio | RR | Vi=-24V to -34V, $I_O$= 100mA f= 120Hz | 52 | 67 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | 1. 1 | | V |
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O$/Ta | $I_O$=5mA, $T_J$=0 to 125°C | | -1 | | mV/。C |

Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.

Note 2) Unless otherwise specified, $V_I$=–29V, $I_O$=500mA, $C_I$=2μF, $C_O$= 1μF

**7924 Electrical Characteristic** (-24V,Type; Ta=25。C)

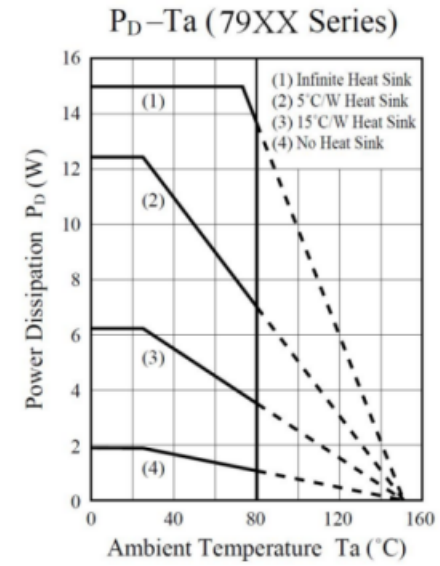
| Characteristics | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | Vo | $T_J$=+25°C | | -23 | -24 | -25 | V |
| Output Voltage tolerance | | Vi=-27V to -38V, $I_O$=5mA to 1A, $P_D$≤15W | | -22.8 | | -25.2 | |
| Line Regulation | $REG_{IN}$ | $T_J$=+25°C | Vi=-27Vto -38V | | 18 | 480 | mV |
| | | | Vi=-30V to -36V | | 6 | 240 | |
| Load Regulation | $REG_L$ | $T_J$=+25°C | Io=5mA to 1.5A | | 12 | 480 | mV |
| | | | Io=250 to 750mA | | 4 | 240 | |
| Bias Current | $I_{bias}$ | TJ=+25°C | | | 3 | 5 | mA |
| Input bias fluctuation | $\Delta I_{bias(IN)}$ | Vi=-27V to -38V, $T_J$=+25°C | | | | 1 | mA |
| Load bias current fluctuation | $\Delta I_{bias(L)}$ | $I_O$=5mA to 1A, $T_J$=+25°C | | | | 0.5 | mA |
| Output noise voltage | Vno | f= 10Hz to 100kHz, $T_J$=+25°C | | | 170 | | μV |
| Ripple rejection ratio | RR | Vi=-28V to -38V, IO= 100mA f= 120Hz | | 50 | 65 | | dB |
| Minimum i/o voltagw di ference | $V_{DIF(min)}$ | $I_O$= 1A, $T_J$=+25°C | | | 1. 1 | | V |

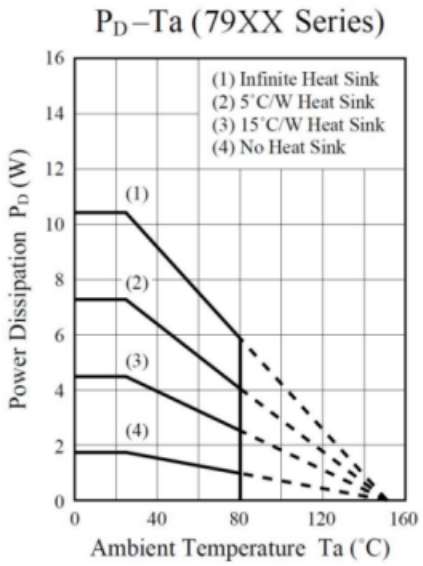
| | | | | | | |
|---|---|---|---|---|---|---|
| Peak output current | $I_{O(Peak)}$ | $T_J$=+25°C | | 2. 1 | | A |
| Outputvoltage temperaturecoe fiient | $\Delta I_O/Ta$ | $I_O$=5mA, $T_J$=0 to 125°C | | -1 | | mV/。 C |

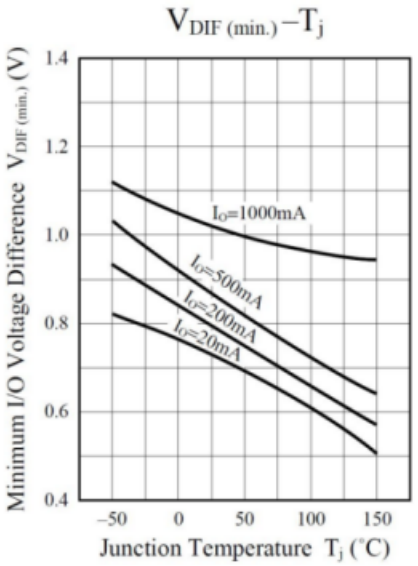
Note 1) The specified condition Tj=25° C means that the test should be carried out with the test time so short (within 10ms) that the drift in characteristic value due to the rise in chip junction temperature can be ignored.

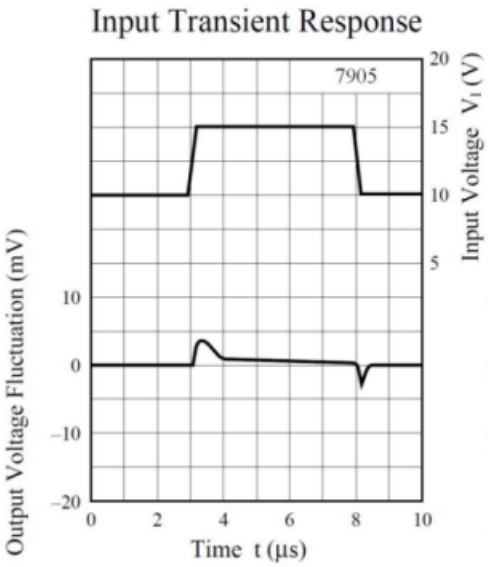
Note 2) Unless otherwise specified, $V_I$=–33V, $I_O$=500mA, $C_I$=2μF, $C_O$= 1μF

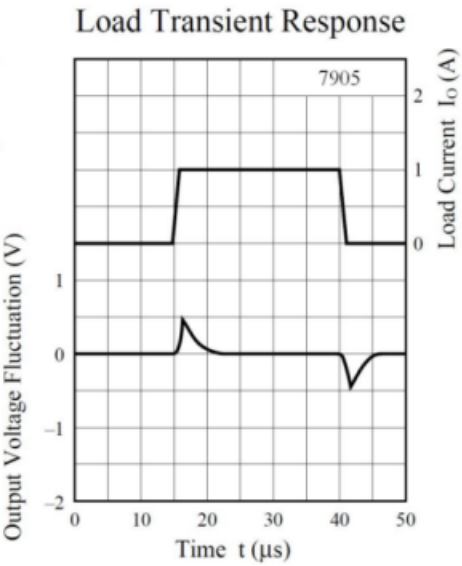
## Characteristics Curve

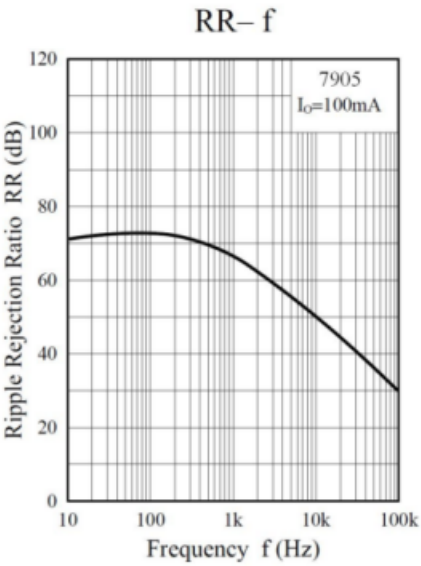


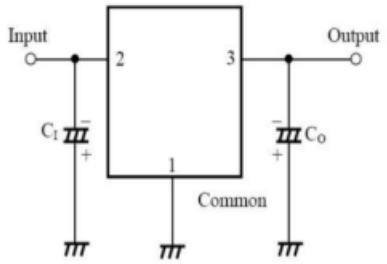



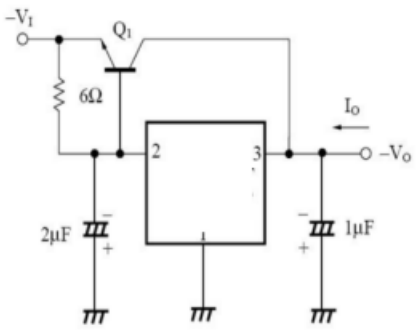



# Basic Regulator Circuit Application Circuit

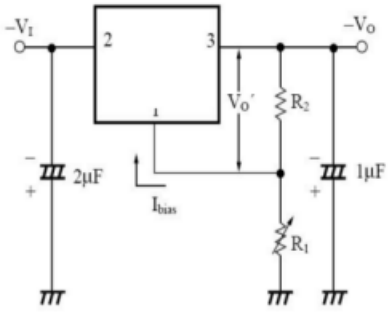



$C_I$ : Required when the input line is long
$C_O$ : Improves the transient response.

1) Current Bootstrap Circuit




2) Adjustable Output Regulator

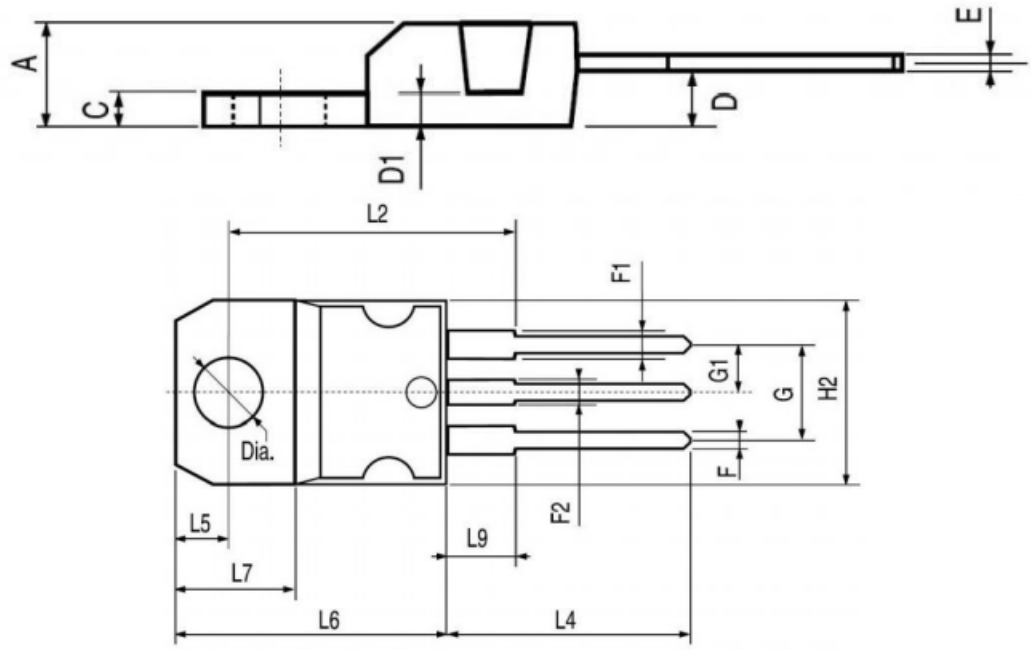



$$|V_O| = V_O' + \left(I_{bias} + \frac{V_O'}{R_2}\right) R_1$$

## Outline Dimensions

### TO-220

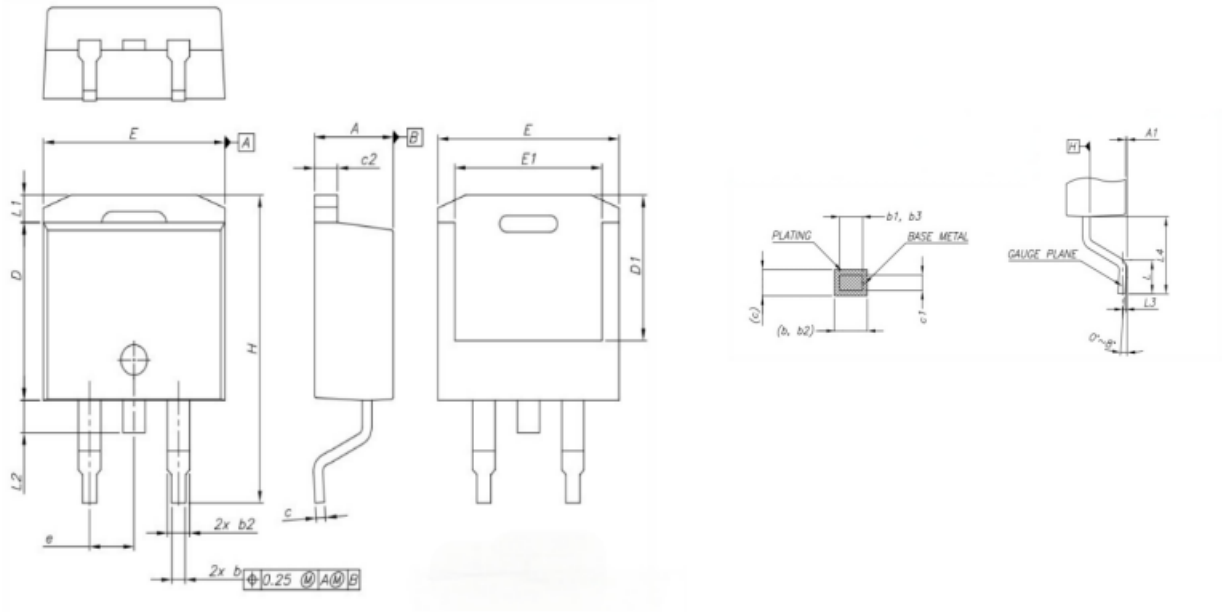
Unit : mm




| Symbol | mm. | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP | MAX. | MIN. | TYP. | MAX. |
| A | 4.40 | | 4.60 | 0.173 | | 0.181 |
| C | 1.23 | | 1.32 | 0.048 | | 0.051 |
| D | 2.40 | | 2.72 | 0.094 | | 0.107 |
| D1 | | 1.27 | | | 0.050 | |
| E | 0.49 | | 0.70 | 0.019 | | 0.027 |
| F | 0.61 | | 0.88 | 0.024 | | 0.034 |
| F1 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| F2 | 1.14 | | 1.70 | 0.044 | | 0.067 |
| G | 4.95 | | 5.15 | 0.194 | | 0.203 |
| G1 | 2.4 | | 2.7 | 0.094 | | 0.106 |
| H2 | 10.0 | | 10.70 | 0.393 | | 0.409 |
| L2 | | 16.4 | | | 0.645 | |
| L4 | 13.0 | | 14.0 | 0.511 | | 0.551 |
| L5 | 2.65 | | 2.95 | 0.104 | | 0.116 |
| L6 | 15.25 | | 15.75 | 0.600 | | 0.620 |
| L7 | 6.2 | | 6.6 | 0.244 | | 0.260 |
| L9 | 3.5 | | 3.93 | 0.137 | | 0.154 |
| DIA. | 3.75 | | 3.85 | 0.147 | | 0.151 |

## TO-263-2

Unit : mm




| Dim. | mm | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 4.36 | | 4.56 |
| A1 | 0 | | 0.25 |
| b | 0.70 | | 0.90 |
| b1 | 0.51 | | 0.89 |
| b2 | 1.17 | | 1.37 |
| b3 | 1.36 | | 1.46 |
| C | 0.38 | | 0.694 |
| c1 | 0.38 | | 0.534 |
| c2 | 1.19 | | 1.34 |
| D | 8.60 | | 9.00 |
| D1 | 6.90 | | 7.50 |
| | 10.15 | | 10.55 |
| E1 | 8.10 | | 8.70 |
| e | | 2.54 | |
| H | 15.00 | | 15.60 |
| L | 1.90 | | 2.50 |
| L1 | | | 1.65 |
| L2 | | | 1.78 |
| L3 | | 0.25 | |
| L4 | 4.78 | | 5.28 |

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